THAT CLAIMED IS:

1. A data collection apparatus to collect data necessary to enable joint analysis of fluroescence, photo-luminescence, and hyperspectral data so as to achieve enhanced imaging of a target, the apparatus comprising:

a ground-mounted modular and scalable frame;

a consolidated instrument array connected to the frame, the array including:

a plurality of spectral sensors adapted to be co-boresighted on the target and comprising at least a first spectral sensor operating in a first frequency region and a second spectral sensor operating in a second frequency region distinct from the first sensor's operating region to thereby enable search of spectral phenomenon occurrences that take place across the boundaries of the sensors,

a light source adapted to emit light at different preselected frequencies to illuminate the target, and

a real-time imager positioned to be co-boresighted with the plurality of spectral sensors; and

a controller positioned in communication with the consolidated instrument array to control operation of the consolidated instrument array.

2. An apparatus as defined in Claim 1, further comprising at least one track and drive assembly connected to the frame to reposition at least one of the plurality of spectral sensors by moving the at least one sensor along the at least one track to

thereby permit the sensor to be optimally positioned relative to the target.

3. An apparatus as defined in Claim 1, further comprising a conveyor to convey the target to an optimal position relative to the plurality of spectral sensors.

4. An apparatus as defined in Claim 1, further comprising a scan mirror assembly to enable acquisition of motion-compensated data from targets that are not at optimal ranges or alignments relative to the plurality of spectral sensors.

5. A data collection apparatus to collect data necessary to achieve enhanced imaging of a target, the apparatus comprising:

a frame;

a consolidated instrument array connected to the frame, the array including a plurality of spectral sensors adapted to be co-boresighted on the target and comprising least a first spectral sensor operating in a first frequency region and a second spectral sensor operating in a second frequency region to thereby enable a search of spectral phenomenon occurrences that take place across the frequency boundaries of the spectral sensors, and a light source adapted to emit light at different preselected frequencies to illuminate the target; and

a controller positioned in communication with the consolidated instrument array to control operation of the consolidated instrument array.

6. An apparatus as defined in Claim 5, further comprising at least one track and drive

assembly connected to the frame to reposition at least one of the plurality of spectral sensors by moving the at least one sensor along the at least one track to thereby permit the sensor to be optimally positioned relative to the target.

7. An apparatus as defined in Claim 5, further comprising a conveyor to convey the target to an optimal position relative to the plurality of spectral sensors.

8. An apparatus as defined in Claim 5, further comprising a scan mirror assembly to enable acquisition of motion-compensated data from targets that are not at optimal ranges or alignments relative to the plurality of spectral sensors.

9. A data collection apparatus to collect data necessary to achieve enhanced imaging of a target, the apparatus comprising:

a frame;

a consolidated instrument array connected to the frame, the array including a plurality of spectral sensors adapted to be co-bore sighted on the target and comprising least a first spectral sensor operating in a first frequency region and a second spectral sensor operating in a second frequency region, and a real-time imager positioned to be co-boresighted with the plurality of spectral sensors; and

a controller positioned in communication with the consolidated instrument array to control operation of the consolidated instrument array.

10. An apparatus as defined in Claim 9, further comprising at least one track and drive

assembly connected to the frame to reposition at least one of the plurality of spectral sensors by moving the at least one sensor along the at least one track to thereby permit the sensor to be optimally positioned relative to the target.

11. An apparatus as defined in Claim 9, further comprising a conveyor to convey the target to an optimal position relative to the plurality of spectral sensors.

12. An apparatus as defined in Claim 9, further comprising a scan mirror assembly to enable acquisition of motion-compensated data from targets that are not at optimal ranges or alignments relative to the plurality of spectral sensors.

13. A data collection apparatus to collect data necessary to achieve enhanced imaging of a target, the apparatus comprising:

a consolidated instrument array, the array including:

a plurality of spectral sensors adapted to be co-boresighted on the target and comprising least a first spectral sensor operating in a first frequency region and a second spectral sensor operating in a second frequency region to thereby enable search of spectral phenomenon occurrences that take place across the frequency boundaries of the sensors,

a light source adapted to be emit light at different preselected frequencies to illuminate the target, and

a real-time imager positioned to be co-boresighted with the plurality of spectral sensors; and

a controller positioned in communication with the consolidated instrument array to coordinate functioning of the consolidated instrument array.

14. An apparatus as defined in Claim 13, further comprising at least one track and drive assembly connected to the frame to reposition at least one of the plurality of spectral sensors by moving the at least one sensor along the at least one track to thereby permit the sensor to be optimally positioned relative to the target.

15. An apparatus as defined in Claim 13, further comprising a conveyor to convey the target to an optimal position relative to the plurality of spectral sensors.

16. An apparatus as defined in Claim 13, further comprising a scan mirror assembly to enable acquisition of motion-compensated data from targets that are not at optimal ranges or alignments relative to the plurality of spectral sensors.

17. A data collection apparatus to achieve enhanced imaging of a target, the apparatus comprising:

a ground-mounted frame for optimally positioning the target;

at least one spectral sensor mounted on the ground-mounted frame and operating in a preselected frequency range, the at least one spectral sensor being mounted so as to permit the spectral sensor to image the target at close range; and

a controller positioned in communication with the at least one spectral sensor to control operation of the at least one spectral sensor.

18. An apparatus as defined in Claim 17, further comprising a light source adapted to emit light at different preselected frequencies to illuminate the target.

19. An apparatus as defined in Claim 18, further comprising a real-time imager positioned to be co-boresighted with the at least one spectral sensor.

20. A consolidated instrument array comprising:

a first spectral sensor operating in a first frequency region; and

at least a second spectral sensor positioned relative to the first spectral sensor so that the at least second spectral sensor is co-boresighted with the first spectral sensor, the at least second spectral sensor operating in a second frequency region distinct from the first sensor's operating region to thereby enable search of spectral phenomenon occurrences that take place across the respective frequency boundaries of the first and at least second spectral sensors.

21. A consolidated instrument array as defined in Claim 20, further comprising a light source adapted to emit light at different preselected frequencies to illuminate the target.

22. A consolidated instrument array as defined in Claim 20, further comprising a real-time

imager positioned to be co-boresighted with the first and at least second spectral sensors.

23. A consolidated instrument array as defined in Claim 22, further comprising a display in communication with the real-time imager and the first and at least second spectral sensors to display a real-time image of the target overlaid with at least one spectral data cube corresponding to the target and generated by the first and at least second spectral sensors.

24. A target and consolidated instrument array mounting frame, the frame comprising:

a base having a top surface portion;

a conveyor positioned on the top surface portion of the base and adapted to convey a target positioned thereon in a substantially horizontal direction;

at least two spaced-apart four vertically extendable posts extending upwardly from the base;

at track positioned above the top surface portion of the base and the conveyor, the tack connected to the four vertically extendable posts;

a platform connected to the track and overlying the conveyor, the platform adapted to receive removably receive a plurality of spectral sensors and positioned to move in a substantially horizontal direction so as to allow the plurality of spectral sensors to be co-boresighted and optimally positioned relative to a target positioned on the conveyor; and

a drive assembly connected to the track and platform to propel the platform along the track.

25. A frame as defined in Claim 24, wherein the platform is further adapted to removably receive at least one real time imager positioned to be co-boresighted with the plurality of spectral sensors.

26. A frame as defined in Claim 25, wherein the frame is further adapted to removably receive at least one light source.

27. A method of enhanced imaging a target over an extended range of spectral frequency ranges, the method comprising:

positioning a plurality of spectral sensors relative to a preselected target to thereby provide an image of the target, each of the plurality of spectral sensors operating in a different spectral frequency range from the other of the plurality of spectral sensors;

co-boresighting each of the plurality of spectral sensors so that an imaginary straight line extends from the center of each sensor to a common point on the target; and

illuminating the target by directing light onto the target from a light source that can be set to different frequencies so as to further enhance imaging of the target by causing the target to re-emit the light at a shifted wavelength.

28. A method as defined in Claim 27, wherein illuminating the target comprises directing light on the target so as to cause fluorescence and photoluminescence excitation.

29. A method of enhanced spectral imaging of a target, the method comprising:

positioning the target on a frame;

mounting a spectral senor on the frame; and

positioning the spectral sensor to provide a substantially close range spectral image of the target.

30. A method as described in Claim 29, wherein the substantially close range is defined by the distance between the target and the spectral sensor and the distance so defined is at least one inch (1") but no more than fifty inches (50").

31. A method as described in Claim 30, wherein the distance is at least six inches (6") but no more than 24 inches (24").

32. A method as defined in Claim 30, further comprising illuminating the target by directing light onto the target from a light source that can be set to different frequencies so as to further enhance imaging of the target by causing the target to re-emit the light at a shifted wavelength.

33. A method as defined in Claim 32, wherein illuminating the target comprises directing light on the target so as to cause fluorescence and photoluminescence excitation.